



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 00-713-i25)

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PATENT  
JUL 08 2003  
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In re Application of: )  
Chad A. Mirkin, et al. )  
Serial No.: 09/976,378 ) Examiner: Jezia Riley  
Filed: October 12, 2001 ) Art Unit: 1656  
For: NANOPARTICLES HAVING ) Confirmation No. 2333  
OLIGONUCLEOTIDES ATTACHED )  
THERETO AND USES THEREFOR )

Commissioner for Patents and Trademarks  
Washington, D.C. 20231

**INFORMATION DISCLOSURE STATEMENT**

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. Mroczkowski, et al., U.S. Patent No. 5,284,748, issued 02/08/94.
2. Engelhardt, et al., U.S. Patent No. 5,288,609, issued 02/22/94.
3. Hainfield, et al., U.S. Patent No. 5,360,895, issued 11/01/94.
4. Kidwell, et al., U.S. Patent No. 5,384,265, issued 01/24/95.

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<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.

5. Beebe, et al., U.S. Patent No. 5,472,881, issued 12/05/95.
6. Stimpson, et al., U.S. Patent No. 5,599,668, issued 02/04/97.
7. Kidwell, et al., U.S. Patent No. 5,637,508, issued 06/10/97.
8. Alivisatos, et al., U.S. Patent No. 5,751,018, issued 05/12/98.
9. Hansen, et al., U.S. Patent No. 5,939,021, issued 08/17/99.
10. Weiss, et al., U.S. Patent No. 5,990,479, issued 11/23/99.
11. WO 93/10564 published 27 May 1993.
12. WO 98/10289 published 12 March 1998.
13. WO 99/23258 published 14 May 1999.
14. WO 99/21934 published 06 May 1999.
15. WO 99/20789 published 29 April 1999.
16. O.D. Velev, et al., "In Situ Assembly of Collordal Particles into Miniaturized Biosensors," *Langmuir*, May 25, 1999, Vol. 15, No. 11, pp. 3693-3698 (May 25, 1999)

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

The present Disclosure Statement is being submitted in compliance with 37 CFR 1.56 insofar as an Examiner might consider any of the cited documents important in deciding whether to

allow the application to issue as a patent, but the citation of each document is not to be construed as an admission that such document is necessarily relevant or prior art. No representation is intended that the cited documents represent the results of a complete search, and it is anticipated that the Examiner, in the normal course of examination, will make an independent search and will determine the best prior art consistent with 37 CFR 1.104(a) and 1.106(b) and, in the course of each search, will review for relevance every document cited on the attached form even if not initialed.

Early and favorable consideration is earnestly solicited.

Respectfully submitted,



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Emily Miao  
Registration No. 35,285

Dated: 1/31/02

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Chicago, Illinois 60606  
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JUN 18 2003

BY HAND DELIVERY TO EXAMINER JEZIA RILEY

PATENT

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Group Art Unit: 1637

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Assistant Commissioner for Patents  
Washington, D.C. 20231

**SIXTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

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1. Merrill, et al., U.S. Patent No. 5,830,986, issued November 3, 1998.
2. Lough, et al., U.S. Patent No. 5,900,481, issued May 4, 1999.

<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.

3. Goldberg, et al., U.S. Patent No. 6,203,989, issued March 20, 2001
4. Bawendi, et al., U.S. Patent No. 6,251,303, issued June 26, 2001.
5. Abbott, et al., U.S. Patent No. 6,277,489, issued August 21, 2001.
6. Bawendi, et al., U.S. Patent No. 6,306,610, issued October 23, 2001
7. Mirkin, et al., U.S. Patent No. 6,361,944, issued March 26, 2002.
8. Wagner, et al., U.S. Patent No. 6,365,418, issued April 02, 2002
9. Mirkin, et al., U.S. Patent No. 6,417,340, issued July 09, 2002
10. WO 93/25709 published 23 December 1993.
11. WO 98/04740 published 5 January 1998
12. WO 98/17317 published 30 April 1998
13. WO 99/60169 published 25 November 1999
14. WO 00/33079 published 8 June 2002
15. WO 01/00876 published 4 January 2001
16. WO 01/51665 published 19 July 2001
17. WO 01/73123 published 4 October 2001
18. WO 01/86301 published 15 November 2001
19. WO 02/04681 published 17 January 2002
20. WO 02/18643 published 7 March 2002
21. WO 02/36169 published 10 May 2002
22. WO 02/46483 published 13 June 2002
23. WO 02/46472 published 13 June 2002
24. Letsinger, R., et al., "Chemistry of Oligonucleotide-Gold Nanoparticle Conjugates," *Phosphorus, Sulfur and Silicon*, Volume 144, p. 359-362 (1999)

25. Letsinger, R., et al., "Use of a Steroid Cyclic Disulfide Anchor in Constructing Gold Nanoparticle—Oligonucleotide Conjugates," *Bioconjugate Chem*, p. 289-291 (2000)
26. Li Z., et al., "Multiple thiol-anchor capped DNA-gold nanoparticle conjugates," *Nucleic Acids Research*, Volume 30, p. 1558-1562 (2002)
27. Nuzzo R., et al., "Spontaneously Organized Molecular Assemblies. 3. Preparation and Properties of Solution Adsorbed Monolayers of Organic Disulfides on Gold Surfaces," *J. Am Chem. Soc.*, Volume 109, p. 2358-2368 (1987)
28. Otsuka, H, et al., "Quantitative and Reversible Lectin-Induced Association of Gold Nonoparticles Modified with  $\alpha$ -Lactosyl- $\omega$ -mercapto-poly(ethylene glycol)," *J. Am Chem. Soc.*, Volume 123, p. 8226-8230 (2001).
29. Wuelfing, P, et al, "Nanometer Gold Clusters Protected by Surface-Bound Monolayers of Thiolated Poly(ethylene glycol) Polymer Electrolyte," *J. Am. Chem. Soc.*, Volume 120, p. 12696-12697 (1998)

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

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Early and favorable consideration is earnestly solicited.

Dated:

9/6/02

  
Respectfully submitted,

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Examiner: Jezia Riley

Group Art Unit: 1637

Confirmation No.: 2333

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**SEVENTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

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1. Heller, et al., U.S. Patent No. 4,966,143 issued 02/26/91
2. Kausch, et al., U.S. Patent No. 5,508,164 issued 04/16/96
3. Ewart, et al., U.S. Patent No. 5,922,537 issued 07/13/99
4. An, et al., U.S. Patent No. 5,972,615 issued 10/26/99

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5. Blackburn, et al., U.S. Patent No. 6,264,825 issued 07/24/01
6. Yguerabide, et al., U.S. Patent No. 6,214,560 issued 04/10/01
7. International Patent WO 94/29484 published 12/22/94
8. International Patent WO 00/25136 published 05/04/00
9. Mohanty J., et al., "Pulsed laser excitation of phosphate stabilized silver nanoparticles," *Proc. Indian Acad.*, Vol. 112, No. 1, p. 63-72 (2000)
10. Nicewarner- Peña S., et al., "Hybridization and Enzymatic Extension of Au Nanoparticle-Bound Oligonucleotides," *J. Am. Chem. Soc.*, Vol. 124, p. 7314-7323 (2002)
11. Whitesides G.M., et al., "Soft Lithography in Biology and Biochemistry," *Annu. Rev. Biomed. Eng.*, p. 335-373 (2001)

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Respectfully submitted,



Dated:

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FORM PTO-1449  
(Rev. 2-32)

U.S. Department of Commerce  
Patent and Trademark Office

Atty. Docket No.

00-713-i25

Serial No.

09/976,378

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

(Use several sheets if necessary)



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Applicant:	Chad A. Mirkin, et al.
Filing Date:	Group
October 12, 2001	1637

## U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
1.	4,996,143	02/26/91	Heller, et al.	435	6	04/13/90
2.	5,508,164	04/16/96	Kausch, et al.	435	6	10/29/93
3.	5,922,537	07/13/99	Ewart, et al.	435	6	11/8/96
4.	5,972,615	10/26/99	An, et al.	435	6	01/21/98
5.	6,264,825	07/24/01	Blackburn, et al.	205	777.5	06/23/99
6.	6,214,560	04/10/01	Yguerabide, et al.	435	7.1	04/18/97

## FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation Yes	Translation No
7.	WO 94/29484	12/22/94	PCT				
8.	WO 00/25136	05/04/00	PCT				

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

9.	Mohanty J., et al. "Pulsed laser excitation of phosphate stabilized silver nanoparticles," <i>Proc. Indian Acad. Sci.</i> , Vol. 112, No. 1, p. 63-72.
10.	Nicewarner-Peña S., et al., "Hybridization and Enzymatic Extension of Au Nanoparticle-Bound Oligonucleotides," <i>J. Am. Chem. Soc.</i> , Vol. 124, p. 7314-7323 (2002)
11.	Whitesides G.M., et al., "Soft Lithography in Biology and Biochemistry," <i>Annu. Rev. Biomed. Eng.</i> , p. 335-373 (2001)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.